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## Gases

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## Gas Data

This application enables data on many gas molecules to be accessed rapidly. You can search on a raw chemical formula, chemical name or UN transportation code. The values displayed on this page are extracted from the literature and the proprietary current AIR LIQUIDE Group data.

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### Gas selection

Chemical Formula	Name	UN Transport Code
<a href="#">Go</a>	Dichlorofluoromethane (R21)	<a href="#">Go</a>

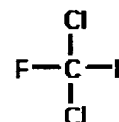
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### CHCl<sub>2</sub>F ; Dichlorofluoromethane (R21)

CAS Number : 75-43-4

UN1029

Halocarbon 21; Dichloromonofluoromethane; Freon F 21;  
Fluorodichloromethane; R 21; Monofluorodichloromethane; Methane  
dichloride



### Main applications

### Industries Applications

Since 2004, the production and consumption of dichlorofluoromethane (R21) are drastically reduced to 15 % of the level of 1989.  
(Montreal protocol: the international agreement signed for the protection of the stratospheric ozone layer).

### Gas Properties

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#### Molecular Weight

- Molecular weight : 102.92 g/mol

#### Critical point

- Critical temperature : 179 °C

- Critical pressure : 51.7 bar

**Gaseous phase**

- Specific gravity (air = 1) (1.013 bar and 21 °C (70 °F)) : 3.82
- Specific volume (1.013 bar and 21 °C (70 °F)) : 0.218 m<sup>3</sup>/kg

**Miscellaneous**

- Solubility in water (1.013 bar and 25 °C (77 °F)) : 2.066 vol/vol

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**Material Safety Data Sheets**

The European Material Safety Data Sheets (MSDS) are made available for information only. Visitors to this site may only use them at their own risk. The MSDSs were prepared by EIGA ( the European Industrial Gas Association) according to European Union standards. Although Air Liquide believes the information in the MSDSs to be correct, Air Liquide cannot be held responsible in any event if the contents do not meet the regulatory requirements of countries outside the European Union. Material Safety Data Sheets are subject to revision. Refer to this web site to ensure that you have the latest version.

MSDS Language

Dichlorofluoromethane (R21)

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**Major Hazards**

- Major hazard : Decomposes when heated
- Toxicity (Am. Conf. Of Gov. Ind. Hygienists ACGIH 2000 Edition) : 10 ppm
- Flammability limits in air (STP conditions) : Non-flammable
- Odour : Slightly Ethereal
- UN Number : UN1029
- EINECS Number : 200-869-8
- DOT Label (USA) : None
- DOT Hazard class (USA) : None

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**Material compatibility**

Air Liquide has assembled data on the compatibility of gases with materials to assist you in evaluating which products to use for a gas system. Although the information has been compile from what Air Liquide believes are reliable sources (International Standards: Compatibility of cylinder and valve materials with gas content; Part 1: ISO 11114-1 (Jul 1998), Part 2: ISO 11114-2 (Mar 2001)), it must be used with extreme caution. No raw data such as this can cover all conditions of concentration, temperature, humidity, impurities and aeration. It is therefore recommended that this table is used to choose possible materials and then more extensive investigation and testing is carried out under the specific conditions of use. The collected data mainly concern high pressure applications at ambient temperature and the safety aspect of material compatibility rather than the quality aspect.

**Material****Compatibility****Metals**

**General Behavior** : Slight risk of corrosion in presence of water.

Aluminium

Satisfactory

Brass	Satisfactory
Copper	Satisfactory
Ferritic Steels (e.g. Carbon steels)	Satisfactory
Stainless Steel	Satisfactory

**Plastics**

Polytetrafluoroethylene (PTFE)	Satisfactory
Polychlorotrifluoroethylene (PCTFE)	Acceptable <b>but important swelling.</b>
Vinylidene polyfluoride (PVDF) (KYNAR™)	no data
Polyamide (PA) (NYLON™)	Satisfactory
Polypropylene (PP)	Acceptable <b>but strong rate of permeation.</b>

**Elastomers**

Buthyl (Isobutene - Isoprene) rubber (IIR)	Non recommended, significant swelling.
Nitrile rubber (NBR)	Non recommended, significant swelling.
Chloroprene (CR)	Non recommended, significant swelling.
Chlorofluorocarbons (FKM) (VITON™)	Non recommended, significant swelling.
Silicon (Q)	Non recommended, significant swelling.
Ethylene - Propylene (EPDM)	Non recommended, significant swelling.

**Lubricants**

Hydrocarbon based lubricant	Non recommended, significant loss of mass by extraction or chemical reaction.
Fluorocarbon based lubricant	Non recommended, significant loss of mass by extraction or chemical reaction.

**Selection of the units**

You can choose the units in which the values are displayed. By default, SI units are selected.

Quantity	Units
Mass	<input checked="" type="radio"/> kg <input type="radio"/> lb <input type="radio"/> g
Volume	<input checked="" type="radio"/> m <sup>3</sup> <input type="radio"/> ft <sup>3</sup> <input type="radio"/> l
Pressure	<input checked="" type="radio"/> bar <input type="radio"/> psi <input type="radio"/> kPa
Temperature	<input checked="" type="radio"/> °C <input type="radio"/> °F <input type="radio"/> K <input type="radio"/> °R
Density	<input checked="" type="radio"/> kg/m <sup>3</sup> <input type="radio"/> lb/ft <sup>3</sup> <input type="radio"/> mol/l <input type="radio"/> (lb-mol)/ft <sup>3</sup>
Enthalpy	<input checked="" type="radio"/> kJ/kg <input type="radio"/> Btu/lb <input type="radio"/> kJ/mol <input type="radio"/> kcal/kg <input type="radio"/> kcal/mol <input type="radio"/> Btu/lb-mol
Heat Capacity	<input checked="" type="radio"/> kJ/(mol.K) <input type="radio"/> Btu/(lb.°F) <input type="radio"/> kJ/(kg.K) <input type="radio"/> Btu/(lb-mol.°F) <input type="radio"/> kcal/(kg <input type="radio"/> cal/(mol.K) <input type="radio"/> J/(mol.K)
Viscosity	<input checked="" type="radio"/> Poise <input type="radio"/> lb/(ft.s) <input type="radio"/> μPa.s <input type="radio"/> Pa.s
Thermal Conductivity	<input checked="" type="radio"/> mW/(m.K) <input type="radio"/> Btu.ft/(h.ft <sup>2</sup> .°F) <input type="radio"/> cal.cm/(h.cm <sup>2</sup> .°C) <input type="radio"/> W/(m.K) <input type="radio"/> (cal.cm)/(s.cm <sup>2</sup> .°C)
Concentration	<input checked="" type="radio"/> vol % <input type="radio"/> vol ppm <input type="radio"/> vol/vol
Solubility	<input checked="" type="radio"/> vol/vol <input type="radio"/> lb/ft <sup>3</sup> <input type="radio"/> (lb-mol)/ft <sup>3</sup> <input type="radio"/> mol/l <input type="radio"/> g/l
Specific volume	<input checked="" type="radio"/> m <sup>3</sup> /kg <input type="radio"/> ft <sup>3</sup> /lb <input type="radio"/> l/mol <input type="radio"/> ft <sup>3</sup> /lb-mol

[Click to change the values](#)[Main applications |](#)[Gas Properties |](#)[Material Safety Data Sheets | Major Hazards | Material compatibility |](#)[Selection of the units |](#)

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